

3rd European Congress on Social Insects

St. Petersburg, Russia, 22–27 August 2005

PROCEEDINGS



***Cardiocondyla elegans*: strict daughter composed nests invaded by unrelated sexuals**

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Keywords: ants, nest genetic structure, ergatoid males, reproductive structure

Cardiocondyla elegans is a small myrmicine ant that lives in sandy and moist soil. In this species, all males are ergatoid (wingless) and mutually tolerant. Female sexuals are normal with functional wings. One nest can contain about 10 males and more than a hundred female sexuals. In such conditions, reproduction must take place inside the nests between brothers and sisters. Therefore, one can assume that this species displays a high amount of inbreeding and that relatedness increases to values above 0.75 (Boomsma et al., 2005). We developed primers for 5 variable microsatellite loci to study the genetic structure of nests (Lenoir et al., 2005). Ten workers from 22 colonies from 4 different locations were genotyped. We also determined the genotypes of 10 winged queens, the sperm contained in their spermathecae and all the males found in two of these colonies.

In the field, nests are at close distances (95% of the nests have a neighbour within 1m) and relationships between workers from different colonies are peaceful. Such conditions usually indicate a polycalic population structure. Nevertheless, we found that each nest of *C. elegans* is composed of the offspring of a single multiply mated mother queen. Our results on sexuals indicate that both the winged females and the males found in a nest can be foreign individuals. As a consequence, the females can be inseminated by their brothers as well as by foreign males, even if they don't leave their natal colony. Multiple mating of gynes lowers nestmate relatedness to some extent. The calculated value of F_{is} is negative, which indicates that the "invasion" of the nests by foreign sexuals seems to compensate inbreeding. Moreover, some alleles are specific to a particular population, leading to a positive F_{st} .

This first genetic study on *C. elegans* shows a very specific reproduction strategy. All the nests are composed of daughter workers of a single queen and constitute meeting places for unrelated sexuals.

References

- Boomsma, J.J., Baer, B. and Heinze, J., 2005. The evolution of male traits in social insects. *Annu. Rev. Entomol.* 50: 395-420.
- Lenoir, J.-C., Schrempf, A., Lenoir, A., Heinze, J. and Mercier, J.-L., 2005. Five polymorphic microsatellite markers for the study of *Cardiocondyla elegans* (Hymenoptera: Myrmicinae). *Mol. Ecol. Notes.*: In press.

The impact of aqueous extracts from *Calatropis procera* (Ait) on *Microtermes* sp.

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Aqueous extracts (2.5%, 5% and 10%) from dried leaves, stems, roots and latex of *Calatropis procera* were tested as a deterrent agent against *Microtermes* sp. The results indicated that the concentrations tested significantly ($p < 0.01$) protected the wooden baits from *Microtermes* sp. The reduction in the weight of wooden baits was found to be inversely proportional to the concentration at all treatments. The protection ranking of the aqueous extracts was as follows: roots, latex, leaves and stem. This anti-feed deterrence qualifies *Calatropis procera* and its products as a biocontrol agent.

Queen mating frequency and male parentage in *Polistes dominulus* (Christ)

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